the bandage left undisturbed, but the next day and every day thereafter the mother applies the bandage, always with the nurse present.

The remainder of the day, and often part of the evening, is spent out of doors. We often have picnics in the woods, sometimes for the children, sometimes for the mothers; we never take both together. We want the mothers to get all the pleasure possible out of these things without the responsibility of watching their children. The mothers take upon themselves quite voluntarily the care of the big bowls of wild flowers we try to keep in the living room and upon the dining tables. Many a mother has said to me, "This is the first bouquet I have ever picked." They are interested in seeing who can find the greatest number of wild flowers during the visit.

Let me say in passing that if you think of starting such a school in the country, you must know a good deal about everything under the sun, not excepting the sun. There seems to be something about country air that makes city children and most of the mothers unusually inquisitive. In one short morning you may be called upon to explain the relation between improper food and bow-legs; tell why the lower leaves of the sumac turn red before the top ones; explain why certain stones are red and others gray; and tell how a katy-did may be distinguished from a cricket.

(*To be continued*)

## ARTERIOSCLEROSIS

By RUTH BREWSTER SHERMAN, R.N.
Graduate of the Johns Hopkins School for Nurses

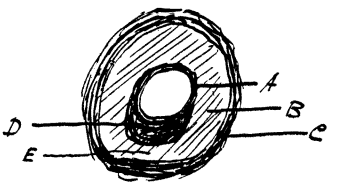
Arteriosclerosis is interesting because it is not a disease which attacks the body from without, but a condition of long, slow and silent development. It owes its existence not to an accident and infection or a "sudden onset by an unseen foe"; it may have its beginning in the tissues of the new-born infant and its growth depends upon all the habits of life through the middle and later years, until that period is reached when the physical body most visibly rewards or sharply punishes its owner for the treatment it has been receiving.

Just as some families and some persons have better or poorer hearts, lungs or stomachs than others, so do some families and some persons have their arteries composed of stronger or weaker material than others. This is just a matter of inheritance and is part of the good or bad heritage which every baby receives from its generations of ancestors. But a child may be born with good arterial material and walls, and through wilful abuse of his body in later life, or by the circumstances of ordinary stren-

uous living and hard work, develop arteriosclerosis as he grows old. How this happens is not hard to understand.

It is a condition of hardening of the arterial wall. The wall of the artery is composed of three layers of tissue, named from within outwardly they are, the intima, the media and the adventitia. Of these the media is the most important, the most easily attacked by poison, the most subject to injury of any kind. After heredity, the second and chief factor in the development of arteriosclerosis comprises the whole habit of life, the use and abuse of the body, the injurious influences which affect the media.

If, from some cause at some small spot in the artery the muscle fibres die or are killed, it is the middle layer, the important media which suffers most injury. At this spot the media becomes thin and weak. The artery here would burst, or at least distend and form an aneurism, did not the intima, or inmost layer of wall, come to the aid of the media. Where the media becomes thin, the intima becomes thicker and so the blood is kept within its bounds and the aneurism is prevented. All would now be




Enlarged from Emerson's "Essentials of Medicine."

Sclerosis of small artery. *A*, intima; *B*, media; *C*, adventitia; *D*, mass of thickened intima; *E*, weakened spot of media.

A small patch of sclerosis partly closing the mouth of small branch artery.

well, were the intima capable of taking the place of the media, but it is not. It is of inferior tissue and this spot of thickened intima is really a scar in the artery; it has little life and soon dies. Lime salts are deposited in this scar and a hard, dense, inelastic, dead spot is left where was once a vital, highly elastic tissue. Here is the beginning of trouble. The spot may be tiny, but through the slow death of the surrounding media and the extension of the inferior and scarring intima this spot will grow—slowly, under conditions of good living and hygiene; quickly, under conditions of abuse; it will creep onward during the rest of life until the time comes to make itself known. Sometimes an artery wall is thickened and hardened in this way continuously through its whole extent, sometimes in large patches, sometimes in a multitude of small spots. It is particularly apt to happen at the points where small arteries branch off from large ones: here, by thickening the walls at the entrance to the small artery they partly close its mouth and impede the entry of blood. Wherever this hardened condition exists the artery is no longer elastic, no longer normal; it is rigid, abnormal, obstructing the circulation,

" schlerotic." A homely illustration of this is familiar to every nurse. When the rubber tube of a fountain syringe is injured by pressure or bending, we know the tube at that point becomes hard and flat. Water in the tube does not flow easily past this place, and if there are several on the tube it is practically useless. The water is held back in the syringe and upper tube and flows very slowly or not at all from the nozzle. This is a picture of what happens in sclerotic arteries.

As a direct result of this impediment to the free passing of blood through the arteries the heart must work harder in order to pump the blood at its usual rate between the thickened and constricting walls. Having to work harder, it becomes itself larger and thicker, like any other overworked muscle—at the same time it becomes less normal and less useful. Whenever a healthy tissue receives an insufficient supply of blood for its nourishment it soon deteriorates, it starves. So does the heart. Being increased in size without any increase in its own nourishing blood supply the heart muscle degenerates, in part, into scar tissue. Following these changes in the heart and disturbance of the whole circulation, the brain and vital organs will degenerate or atrophy and their functions become deranged. These changes are seen in the conditions which develop later when the patient is seriously ill—the headache and delirium, paralysis, disordered urine, etc.

What brings on this condition in a person who was born with good material in his arteries? Many causes are known although some of the connections are not yet clearly understood. For convenience we may class them as natural and unnatural causes.

(1) By *natural causes* we may understand hard work and overeating. Hard muscular work, or too hard physical exercise, raises the blood pressure and, by hardening and toughening all the muscles, increases the resistance to the natural flow of blood through the body tissues. Nearly all persons who do especially hard work, or who work even moderately hard all their lives, have more or less arteriosclerosis. The same is true of those who habitually eat very heavily and it is believed that this cause alone often brings about the condition.

(2) By *unnatural causes* we may understand mental worry, alcohol and the " toxins " or poisons of disease. The relation of worry to arteriosclerosis is not clear, but it is known and recognized. The poisons are more easily understood. Alcohol, lead poisoning, gout, syphilis, typhoid and other acute infections, and diseases of the kidneys, all predispose and indeed often lead directly to this degeneration, malformation and destruction of arterial tissue which is the bane of old age and which " is now believed to be the direct or indirect cause of the majority of the deaths of men."

Nearly all old people have become, or do become, more or less sclerotic, so that the condition is often found in elderly women. But we most commonly see it in men of fifty-five or sixty years, who, after lives of active work and mental strain, hearty eating and frequent alcoholic drinking, are suddenly stricken down upon beds which they too often never leave again. The picture is much the same as that in other forms of heart disease; there are weakness, high blood pressure, full pulse beat usually not rapid, more or less dyspnœa, cyanosis, headache, constipation and renal disturbances. There may be Cheyne-Stokes * respiration when lying in certain positions, paralysis, delirium or coma. The treatment of these patients is chiefly symptomatic with frequent observations of the blood pressure. To relieve coma venesection is sometimes done with temporary success. The patient may live for some weeks or even months after being stricken, but recovery of health can hardly be expected, since it is impossible to remove or relieve the sclerotic condition of the arterial walls. The nursing care includes nothing unusual—hygiene, diet and medicine as the case requires, the avoidance of all that may excite, exert or irritate the invalid, frequent turning if he cannot turn himself, cold applications to the head, recognition of mental conditions as they arise, the inducing of sleep, a cool, shaded room with plenty of fresh and *flowing* air, absence of noise or unnecessary movement in the room and a gentle, tactful exclusion of any disturbing influence from the outside.

More cheering is the contemplation of what may be done during the middle and later years of life toward preventing the development of arteriosclerosis. So far as practicable life should be taken more easily than before; but even when hard work and mental strain cannot be given up much good may be gained and many years of safety be purchased by a well-regulated life, attention to daily bathing and to the condition of bowels and kidneys, by avoiding excessive eating and drinking, by strict avoidance of alcohol in all forms, by use of mineral waters and by occa-

* I wish to say a word here regarding the growth of knowledge concerning Cheyne-Stokes respiration. Cheyne first observed this symptom and William Stokes fully described it in his book "Diseases of the Heart and Aorta," published about 1853. His son writes in his biography, "Stokes never committed himself to any theories as to its explanation, nor did he restrict it to the conditions in which he observed its best illustrations." For fifty more years little or nothing was known of the reason for this well-known feature of grave illness. Until comparatively lately it was considered a terminal symptom of any disease in which it occurred. Now, however, through investigations of the blood-pressure the causes, conditions, and relief of Cheyne-Stokes respiration are well understood by physicians, and its appearance in the course of a disease is now regarded as an interesting symptom, but by no means a dangerous or even highly important one.

sionally consulting a doctor for general advice or treatment. All authorities lay great stress in this connection upon temperate eating and Osler says that the present generation, if they would avoid arteriosclerosis, need the old advice given long ago by Cheyne:

"Every wise man, after *fifty,* ought to begin to lessen at least the quantity of his *aliment,* and if he would continue free of great and dangerous distempers and preserve his senses and faculties clear to the last he ought every seven years go on abating gradually and sensibly and at last *descend* out of life as he ascended into it, even on the child's diet."

The English surgeon, Sir James Paget, one of the foremost medical men of his time and one of the best known teachers and lecturers on anatomy and surgery, taught his students very largely by comparison and analogy. In 1880 he gave at Cambridge the Hunterian oration, taking for his subject "Elementary Pathology." In this lecture Paget described many diseases of plant life and related them to human pathology. The following passage on falling leaves is in itself beautiful and the similarity between the dying of the leaf and sclerosis of human arteries seems too clear to need pointing out. He spoke, in part, as follows:

"Let me now point out another of the lessons which may be read in the decaying leaves; for, really, the pathologist may find in them as many as the moralist and the poet have found. The leaves, I have said, are decaying, not dead; and their fall is due to other degenerative yet truly vital changes. Dead leaves do not similarly fall. If a branch has been killed before autumn, you may often see its dead and withered leaves hanging dry and withered all the winter through; and often, when leaves are yellow and withered in their last decay, they hang quivering and spinning, ready to fall, yet waiting. Each leaf is literally hanging on a thread; and at last, by a rougher wind, or a drop of rain, or some chance violence, the thread is broken and the leaf falls.

"This breaking of the thread is preceded by degenerative changes in the structures both of the leaf stalk and of the stem, adjacent to their juncture or articulation. . . . At their beginning and maturity, the structures of the leaf-stalk and the stem or twig on which it rests are continuous. There may be some external mark of distinction, but within there is strict continuity; the epidermis, parenchyma, fibres and sap-vessels are alike continuous. But, in preparation for the fall, changes ensue in the adjacent parts of both leaf-stalk and stem. In both, alike and equally, the cells multiply by partition; and those most nearly adjacent change, by a process of degeneration, into cork-cells, dry, brown and air-holding. Then, as these degenerative changes advance from opposite

directions toward the plane of junction between leaf and stem or twig, they meet, and, at their place of meeting, an intermediate layer, or rather two layers, of cells die and become scale-like and part asunder; and now the leaf is ready to fall. It hangs only on a dried thread of fibres and vessels which pass into it from the stem; and the stem is protected by its layers of cork and withered cells from the invasion of parasites and insects.

"It would be hard to find a more admirable instance of processes adjacent, coincident, concurrent to a common end, yet independent. We have many of the kind in our pathology, but none more evident, or more within reach of complete study, as of vital processes tending to one end, but not guided from one centre; concurrent, but not concatenate; as independent as are the works of the several bees that make one honey comb. And thus we may learn from the falling leaves a lesson against thinking that, when we see concurrent morbid processes, we must always expect to find some centre from which all are guided. It is not to be doubted that in organisms such as ours, in which the work is more divided according to its kind and more distributed to appropriate organs, more is subjected to regulation by central organs, and the working of each part is more influenced by that of all the rest; yet it is not probable that, in any instance, the law is abrogated according to which each elemental structure lives its own life in a method determined by its own inherent properties. There is no principle in pathology more important than this: let the falling leaves remind us of it."

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## THE HOUSING OF NURSES DURING TRAINING AND AFTER GRADUATION

By BLANCHE M. THAYER, R.N.
Former Superintendent of the City Hospital and Training School, Quincy, Mass.

A SUBJECT of intense interest to me for many years has been the home life of nurses while in training and after graduation. This is a field in which a good deal has been done for nurses during training in providing residences for pupils and we have many nurses' homes in connection with hospitals,—some combining privacy and comfort with some elegance, and others attractive enough, externally, but without that cheer and home atmosphere within, which softens the feeling of desolation one experiences when first set down among strangers to begin a work so difficult as that of the nurse. After a trying day in a hospital ward, with the weight of anxiety to do properly work that is totally unfamiliar,